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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 22

Application Number: 09/127,644
Filing Date: July 31, 1998
Appellant(s): SCHOB, RETO

Kevin LeMond
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 2/15/02.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct, but does not refer to the specification by line and page number.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1, 3, 4, 5, 8, 10, and 14 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

PATENT NUMBER	INVENTOR	PUBLICATION DATE
4,043,614	Lyman	8/1977
WO 97/15978	Nichols et al.	5/1997
EPOI 130,541	Shimamoto	6/1984
4,668,885	Scheller	5/1987

(10) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claims 1, 3-8, 10, 14, and 17-21 are rejected under 35 U.S.C. 103. This rejection is set forth in prior Office Action, Paper No.16. The rejection is repeated below for the convenience of the Board of Appeals and Interferences.

Claims 1, 4, 8, 9, 10, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols and Lyman. Nichols teaches a magnetically levitated ring shaped rotor which the stator having axially aligned levitating magnets and circumferentially disposed field windings 40 to rotate the rotor. Nichols teaches unipolar rotor flux in the ferromagnetic, reluctance poles of the rotor which close the magnetic circuit with the stator bearing magnets 38. Nichols teaches control windings 42 on the stator to control the unipolar magnetic bearing flux. Nichols teaches every aspect of the invention, except permanent magnets on the rotor creating unipolar magnetic bearing flux and an additional stator(or two) in a plane parallel with bearing plane.

Lyman teaches an axially oriented permanent magnet 31 on the rotor to provide magnetic bearing flux across the air gap with the stator. Lyman teaches the rotor can be either disk shaped inside the ring shaped stator or the rotor can be ring shaped outside the stator. Lyman teaches a plurality of stators in parallel to provide magnetic bearing support to the rotor. Lyman does not teach a plurality of magnets on the arranged on the disk shaped rotor. Nichols teaches the permanent magnet producing the bearing flux being four circumferentially, spatially modulated magnets 38a rather than a single permanent magnet. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Nichols with the permanent magnet on the rotor as in Lyman to efficiently support a rotor with a large moment of inertia, and with a first and second stator in parallel with the bearing plane because Lyman teaches a plurality of bearing disks provide additional support to rotor.

Claims 1, 3, 4, 5, 8, 10, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller(US 4,668,885). Shimamoto teaches annular rings on the rotor and stator with a unipolar flux journal, where the stator includes a means to produce a field 30 for the rotation of the rotor. Shimamoto teaches control windings 82, 84, 86, 88 to control the magnet journal flux. Shimamoto teaches an axially magnetized permanent magnets 62/64 on the stator having control windings 88 and axially magnetized permanent magnets 70/72 on the rotor, where the permanent magnets 62/64 and 70/72 are positioned on opposite sides of a rotor ring 56 and stator disk 48. Shimamoto teaches rings 66 and 68 which are parallel to the bearing plane at 46. Shimamoto teaches a disc shaped motor stator 16 which is parallel to the bearing

plane. Shimamoto does not teach the magnets being spatially modulated. Scheller teaches a plurality of spatially modulated magnets 10 are equivalent to an annular ring magnet. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Shimamoto with spatially modulated magnets because Scheller teaches a plurality of spatially modulated magnets are simple and easy to manufacture.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller, in further view of Machino. Shimamoto and Scheller teach every aspect of the invention, except the permanent magnets on the rotor and stator being both radially aligned and alternately aligned(one axially/one radially magnetized). Machino teaches the equivalence of permanent magnets being both axially aligned(figure 1a), both radially aligned (figure 1b) and alternately aligned(figure 3 showing the stator magnet being radially magnetized with the rotor magnet being axially aligned). It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Shimamoto and Scheller with the bearing magnets on the rotor and stator being both radially aligned or alternately aligned because Machino teaches the equivalence of the magnetization of the bearings being axially, radially or alternatively magnetized, and it would have an obvious selection of equivalents to choose between different magnetization for the bearing.

Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols and Lyman, in further view of German Patent 945,183('183). Nichols and Lyman teach every aspect of the invention except, a rotatable drive which can be

magnetically coupled to the rotor. '183 teaches a magnetic couple drive with a radial magnetic couple 20 and an axial magnetic couple 11 which are equivalent to a motor driven 28 rotor. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Nichols and Lyman with the magnetic couple drive because '183 teaches the equivalence of a magnetic couple drive and a motor drive, such that it would have been an obvious design choice to select between known equivalents, and because a mechanical drive allows the drive source to be positioned away from the rotor.

Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols and Lyman, in further view of Schoeb. Nichols and Lyman teach every aspect of the invention, except the use of the motor in biological liquids and in a bio-reactor. Schoeb teaches the use of motors in biological liquids and in a bio-reactor. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Nichols and Lyman for use in biological liquids to allow the motors to operate as blood pumps, as in Schoeb.

Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller, in further view of German Patent 945,183('183). Shimamoto and Scheller teach every aspect of the invention except, a rotatable drive which can be magnetically coupled to the rotor. '183 teaches a magnetic couple drive with a radial magnetic couple 20 and an axial magnetic couple 11 which are equivalent to a motor driven 28 rotor. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Shimamoto and Scheller with the magnetic

couple drive because '183 teaches the equivalence of a magnetic couple drive and a motor drive, such that it would have been an obvious design choice to select between known equivalents, and because a mechanical drive allows the drive source to be positioned away from the rotor.

Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller, in further view of Schoeb. Shimamoto and Scheller teach every aspect of the invention, except the use of the motor in biological liquids and in a bio-reactor. Schoeb teaches the use of motors in biological liquids and in a bio-reactor. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Shimamoto and Scheller, for use in biological liquids to allow the motors to operate as blood pumps, as in Schoeb.

(11) Response to Argument

The Applicant's argument that there is no motivation Nichols and Lyman is not persuasive. Nichols teaches a unipolar magnetic bearing(flux always travels the same direction) with the unipolar flux being generated on the stator. Nichols teaches every aspect of the invention except the permanent magnets are on the stator instead of the rotor. Lyman teaches that it is known to position the magnets of a unipolar bearing on the rotor. It is inherent that the magnet on the rotor complements the magnet on the stator and provides addition flux to the bearing system and additional inertia/weight. Lyman specifically teaches in column 8, line 24-25 that the magnetic bearing system can be made with or without the rotor magnet. It is within the ordinary skill in the art to

choose between the known equivalents to provide a rotor with or without the rotor magnet.

The Applicant's argument that Nichols does not teach the magnet to cause the inhomogeneous flux is not correct. The magnetic flux from the permanent magnets becomes spatially modulated at the air gap between the rotor the stator due to the teeth on the rotor and the stator. The Applicant's argument that Lyman teaches away from inhomogeneous magnetic flux is not persuasive. The Lyman teaches spatially modulated flux due to the stator pole teeth. The Applicant's argument regarding minimizing disturbances and compensation means (as in col. 1, line 41 is not persuasive). The flywheels of Lyman and Nichols are dynamic systems which include feedback systems to compensation coils to maintain the position of the rotor against unbalance, not against inhomogeneous flux. There is no teaching in Lyman against or away from inhomogenous flux. The combined teaching of the two references clearly shows that the unipolar magnetic bearings, such as Nichols can be made with or without magnets on the rotor, as taught by Lyman. The rejection is proper and should be maintained.

The Applicant's arguments that Lyman and Nichols do not teach inhomogeneous magnetic flux is not persuasive. Both references teach spatially alternating magnet flux because the magnetic flux from the permanent magnets is spatially alternated by the poles on the rotor and the stator. The poles create areas of high and low magnetic permeability, which is spatially alternating.

The Applicant's argument regarding impermissible hindsight is not persuasive. The Applicant must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). The rejection of the claims are based solely on Lyman and Nichols, as set Final Office Action. The rejection of the Applicant's overbroad claims should be maintained.

The Applicant's argument that Shimamoto and Scheller do not teach an inhomogeneous magnet. Scheller teaches an inhomogeneous magnetic field(spatially alternating) on col. 3, line 29. The Applicant's argument is directly contrary to Schellers teaching that the magnet can be either spatially modulated(separated) or homogenious(closely spaced). The Applicant's argument the Lyman and Shimamoto require homogenious magnetic fields is not persuasive. They only require ring magnets, which Schneller teaches can be homogenious or spatially modulated. The Applicant is arguing that spatially modulated ring magnets is a patentable feature which should be removed by the public domain by the issuance of this application as a patent, when Scheller teaches the magnet is known in the art. The rejection is proper and should be maintained.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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PRIMARY EXAMINER

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Primary Examiner
Art Unit 2834

KIT
May 1, 2002

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